

**College of Engineering**

**Georgia Institute of Technology**

**Atlanta, Georgia**

**NASA-GIT PREDOCTORAL DESIGN TRAINING PROGRAM**

**GRANT NOS. NGT 11-002-064 and NGR 11-002-081**

**P R O G R E S S   R E P O R T**

**AUGUST 31, 1971 – AUGUST 31, 1972**

**September 1972**



## I. SUMMARY

August 31, 1971 terminates the fifth year of the NASA Design Traineeship Program at Georgia Institute of Technology. A total of eleven Trainees were supported directly by NGT 11-002-064. A total of nine current and former Trainees were enrolled in Georgia Tech's graduate School during the year and were assisted in their research efforts to varying degrees by NGR 11-002-081.

Two Trainees received their Ph.D. degrees and went to work in industry during the reporting period. Roscoe M. Hinson completed his thesis entitled "A Collision Avoidance Warning Criterion for Maneuvering Aircraft". He is employed by Lummus Industries, manufacturers of agricultural equipment, in Columbus, Georgia as a senior design engineer. Robert S. Gordy completed his thesis entitled "A Computer Aided Broad Band Impedance Matching Technique Using a Comparison Reflectometer". He is employed by Electronic Communications, Inc., manufacturers of communication and signal processing equipment in St. Petersburg, Florida in new product development engineering. Several copies of their theses are forwarded with this report.

1971-72 was a year that many students decided that pursuing the Ph.D was not worth the sacrifice involved. This was true of graduate students in general not just Design Trainees. A total of seven current or former Trainees left graduate school without receiving the Ph.D. Two of them plan to finish their Ph.D. in absention however. All but one have received an M.S. This leaves a total of four students who are enrolled in graduate school. Three of these will be supported by the grant extension. The students who still intend to complete the requirements of the Ph.D, Charles Andrews, William Crichton, Lester Dozier, Richard Hess, William Pugh and Harvey Taylor, have completed all course work required and are working on thesis only.

A cooperative effort between Georgia Tech and Lockheed-Georgia Company to develop a system of interactive graphics for computer-aided design is continuing. Lockheed-Georgia has one of the leading groups in the nation in the nation in the development of interactive graphics. The graphics equipment at Lockheed with light pen is being connected to the Univac 1108 at Tech. Lockheed is providing their system time free to our Faculty and

Trainees. Georgia Tech through NGR 11-002-081 is providing the actual labor and hook-up costs.

The complex system design project courses have been expanded to include the formal participation of civil engineering as well as the original mechanical, electrical and aeronautical engineering schools. An interdisciplinary committee, The Urban Systems Committee, has been appointed by the Dean of Engineering and this committee has become the interdisciplinary advisory body to the course sequence.

A draft text entitled "Rational Planning: A System Approach" was printed in September 1971.

Copies have been previously furnished to NASA. Extensive revisions are underway. Dr. Joe Robertshaw, co-author with Dr. Dickerson, has visited Georgia Tech during December 1971 and all of August 1972 for the purpose of working on such revisions. Dr. Robertshaw is a physics professor at Providence College (Rhode Island)

This report has been prepared by Dr. Steve L. Dickerson, Project Coordinator with the assistance of Dr. Virgil Smith (A.E.) and Dr. Thomas White (E.E.) who are part of the principal staff carrying out the program and doing the teaching in it.

## II. TRAINEE STATUS AND PROGRAMS

Those current and former Trainees who have received graduate credit at Georgia Tech during the reporting period are as follows.

Name	Major	GPA	Course Work Completed	PhD Qualified Passed	Foreign Language Satisfied	MS Degree	PhD Degree
<u>Original</u>							
Charles R. Andrews	EE	3.4	Yes	Yes	Yes	Yes	No
Lester D. Dozier	ME	3.1	Yes	Yes	Yes	Yes	No
Richard Hess	ME	3.6	Yes	Yes	Yes	Yes	No
Roscoe M. Hinson	ME	3.7	Yes	Yes	Yes	Yes	Yes
Harvey C. Taylor	ME	3.9	Yes	Yes	Yes	Yes	No
<u>Supplement I</u>							
William I. Crichton, Jr.	ISE	3.8	Yes	Yes	No	Yes	No
Robert S. Gordy	EE	3.7	Yes	Yes	Yes	Yes	Yes
William E. Pugh	ME	3.6	Yes	Yes	Yes	Yes	No
<u>Supplement II</u>							
John H. Duchman	ISE	3.2	No	No	No	No	No
Carroll S. Kirkpatrick	ME	3.6	No	No	No	Yes	No
Francis W. Skwira	ME	3.3	No	Yes	Yes	Yes	No

Roscoe Hinson completed his PhD requirements at the end of the Winter Quarter 1972. Robert Gordy completed his PhD requirements at the beginning of Summer Quarter 1972. Charles Andrews was called into active duty in the Air Force (an ROTC obligation) in March of 1972. He has applied to complete his thesis in absentia. William Crichton left Georgia Tech in December of 1971 to go to work full time. He had previously transferred from Trainee status to instructor status for financial reasons. He intends to finish his thesis in absentia. John Duckman left Georgia Tech in January of 1972. He had considerable academic and marital problems during the preceeding quarters. Carroll Kirkpatrick terminated his graduate work during the summer of 1972 after completing his M.S. He was an outstanding student - certainly capable of finishing a

PhD - but chose to go to work at this time. Francis Skwira returned to work at General Electric, from which he had a leave of absence, at the beginning of Summer 1972. He was having some problems defining a thesis topic satisfactory to the faculty and chose to go back to work.

The following pages give an itemized accounting of the academic record of those Trainees directly supported by NGT 11-002-064.

JOHN HUGHES DUCHMAN

<u>Courses Taken</u>		<u>Grades</u>	<u>Quarter Hours</u>
<u>Fall 1971</u>			
ISyE 404	Optimization	X	3
ME 654	Systems Design Methodology	F	3
Math 404	Introduction to Analysis	V	3
ISyE 700	Thesis		3

CARROLL STONE KIRKPATRICK

<u>Courses Taken</u>		<u>Grades</u>	<u>Quarter Hours</u>
<u>Fall 1971</u>			
ME 622	Thermodynamics I	A	3
ME 700	Thesis		12
<u>Winter 1972</u>			
CE 753	STRUDEL Seminar	A	1
ME 623	Thermodynamics II	W	3
ME 700	Thesis		
<u>Spring 1972</u>			
CE 671	Plastic Design in Steel	A	4
MGT 443	Investments	V	3
ME 700	Thesis		12



FRANCIS WILLIAM SKWIRA

<u>Course Taken</u>		<u>Grades</u>	<u>Quarter Hours</u>
<u>Fall 1971</u>			
ME 742	Two Phase Flow I	B	3
Math 671	Mathematical Methods of Applied Science I	B	5
ME 800	Thesis		4
<u>Winter 1972</u>			
ME 623	Thermodynamics II	A	3
Math 672	Mathematical Methods of Applied Science II	B	5
ME 800	Thesis		8
<u>Spring 1972</u>			
ME 659	Engineering Design	W	5
Math 673	Mathematical Methods of Applied Science III	B	5
ME 800	Thesis		7

